

September 15, 1997
CAK-9763:js

NASA Vision and Implementation Approach for Advanced Technologies
in Space

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Abstract

NASA has invested significantly in development of advanced technology for future space missions. Micro and nano technologies have been part of this investment. NASA has also established the New Millennium Program to use these technologies in actual missions where technology demonstration is the primary goal but Earth or Space Science is a significant secondary objective. In addition, NASA has made the use of advanced technology a criterion (and also a fiscal necessity) in the selection of new faster, better, cheaper missions.

Micro and nano technologies are enabling for microspacecraft where everything must be small, but they can also be enabling for scientific investigations on larger missions and can provide major new capabilities for human exploration missions.

Amongst the micro and nano technologies are:

- Avionics
 - low power spacecraft electronics
 - scalable flight computer
 - neural networks

- Microsensors and microinstruments

 - tunable diode laser

 - microseismometer

 - microgyro

 - diffractive optics hyperspectral imager

 - chemical and biological sensors

 - miniature NMR & EPR

- Advanced detectors

 - active pixel sensor

 - Quantum Well Infrared Photodetector (QWIP)

 - ultraviolet (UV) CCD